

CLAIMS

What is claimed is:

1. A composition comprising a polymer having at least one first monomeric unit having Formula I(a), in Figure 1, wherein:
  - Ar<sup>1</sup> can be the same or different at each occurrence and is selected from aryl and heteroaryl;
  - Ar<sup>2</sup> can be the same or different at each occurrence and is selected from arylene and heteroarylene;
  - R<sup>1</sup> can be the same or different at each occurrence and is selected from H, alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, and C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>; or adjacent R<sup>1</sup> groups can be joined to form 5- or 6-membered rings;
  - n is an integer; and
  - a, b, c, and d are 0 or an integer such that a+b = 2n + 1, and c + d = 5.
2. The composition of Claim 1 wherein Ar<sup>1</sup> is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
3. The composition of Claim 1 wherein N(R<sup>1</sup>)<sub>2</sub> is selected from carbazoles, benzodiazoles, and benzotriazoles.
4. The composition of Claim 1 wherein R<sup>1</sup> is selected from alkyl groups having 1 through 12 carbon atoms, phenyl and benzyl.
5. A composition comprising a polymer having at least one first monomeric unit having Formula II(a) in Figure 2, wherein:
  - R<sup>2</sup> and R<sup>3</sup> are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, OC<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, and OC<sub>6</sub>H<sub>c</sub>F<sub>d</sub>;
  - R<sup>4</sup> is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;
  - a, b, c, and d are 0 or an integer such that a+b = 2n + 1, and c + d = 5,
  - n is an integer;
  - x is 0, 1 or 2; and
  - y is 0 or an integer from 1 through 3;
 with the proviso that there is at least one substituent on an aromatic group selected from F, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, OC<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, and OC<sub>6</sub>H<sub>c</sub>F<sub>d</sub>.

6. A composition comprising a polymer having at least one first monomeric unit having Formula II(b) in Figure 2, wherein:

$R^2$  and  $R^3$  are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl,

5 aryl, heteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;

$R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

10 n is an integer;

x is 0, 1 or 2; and

y is 0 or an integer from 1 through 3;

with the proviso that there is at least one substituent on an aromatic group selected from F,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ .

15 7. A composition comprising a polymer having at least one first monomeric unit having Formula II(c) in Figure 2, wherein:

$R^2$  and  $R^3$  are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl,

aryl, heteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;

20  $R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

n is an integer;

25 p is 0 or 1; and

y is 0 or an integer from 1 through 3;

with the proviso that there is at least one substituent on an aromatic group selected from F,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ .

30 8. The composition of any one of Claims 5, 6, or 7, wherein  $R^2$  is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.

9. The composition of Claims 5, 6, or 7, wherein  $R^4$  is selected from phenylene, phenylenalkylene, alkylene and alkenylene.

35 10. A composition comprising a polymer having at least one first monomeric unit having Formula III(a), in Figure 3, wherein:

$R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

- $R^5$  is the same or different at each occurrence and is selected from H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl, alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl, alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ , or both of  $R^5$  together may constitute an arylene or heteroarylene group;
- a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,
- n is an integer; and
- z is 0 or an integer from 1 through 4; and wherein such polymer is not a homopolymer.
11. A composition comprising a polymer having at least one first monomeric unit having Formula III(a), in Figure 3, wherein:
- $R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;
- $R^5$  is the same or different at each occurrence and is selected from H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl, alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl, alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ , or both of  $R^5$  together may constitute an arylene or heteroarylene group;
- a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,
- n is an integer; and
- x is 0, 1, or 2.
12. The composition of Claims 10 or 11, wherein  $R^4$  is selected from phenylene, phenylenalkylene, alkylene and alkenylene.
13. The composition of Claims 10 or 11, wherein  $R^5$  is selected from phenylalkenyl groups, phenylalkynyl groups, alkylacetate groups, arylcarbonyl groups, alkyl groups having 1 through 12 carbon atoms, phenyl groups, substituted phenyl groups, pyridyl groups, and substituted pyridyl groups.
14. The composition of Claims 10 or 11, wherein two adjacent  $R^5$  together are a biarylene group.
15. A material comprising a polymer having at least one first monomeric unit having Formula I, I(a) through I(c) in Figure 1 and at least

one second monomeric unit selected from Formulae II(a) through II(c) in Figure 2 and Formulae III(a) to III(d) in Figure 3, wherein:

in Formulae I(a) through I(c):

5 Ar<sup>1</sup> can be the same or different at each occurrence and is selected from aryl and heteroaryl;

Ar<sup>2</sup> can be the same or different at each occurrence and is selected from arylene and heteroarylene;

10 R<sup>1</sup> can be the same or different at each occurrence and is selected from H, alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, and C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>; or adjacent R<sup>1</sup> groups can be joined to form 5- or 6-membered rings;

n is an integer; and

a, b, c, and d are 0 or an integer such that a+b = 2n + 1, and c + d = 5;

15 in Formulae II(a) through II(c):

R<sup>2</sup> and R<sup>3</sup> are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, OC<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, and OC<sub>6</sub>H<sub>c</sub>F<sub>d</sub>;

20 R<sup>4</sup> is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

a, b, c, and d are 0 or an integer such that a+b = 2n + 1, and c + d = 5,

n is an integer;

p is 0 or 1;

25 x is 0, 1 or 2; and

y is 0 or an integer from 1 through 3;

with the proviso that there is at least one substituent on an aromatic group selected from F, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, OC<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, and OC<sub>6</sub>H<sub>c</sub>F<sub>d</sub>;

in Formulae III(a) through III(d):

30 R<sup>4</sup> is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

35 R<sup>5</sup> is the same or different at each occurrence and is selected from H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl, alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl, alkynylheteroaryl, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, OC<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, and OC<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, or both of R<sup>5</sup> together may constitute an arylene or heteroarylene group;

- a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,  
n is an integer;  
x is 0, 1, or 2;  
5 y is 0, 1, 2, or 3; and  
z is 0 or an integer from 1 through 4.
16. A composition comprising a polymer having at least one first monomeric unit selected from Formulae IV(a) through IV(e) in Figure 4.
- 10 17. A composition comprising a polymer having at least one first monomeric unit having Formula IV(f) in Figure 4.
18. An electronic device comprising a composition comprising a polymer having at least one first monomeric unit having Formula I(a), I(b), or I(c), in Figure 1, wherein:
- 15 Ar<sup>1</sup> can be the same or different at each occurrence and is selected from aryl and heteroaryl;  
Ar<sup>2</sup> can be the same or different at each occurrence and is selected from arylene and heteroarylene;  
R<sup>1</sup> can be the same or different at each occurrence and is selected from H, alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene,  
20 heteroarylalkylene, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, and C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>; or adjacent R<sup>1</sup> groups can be joined to form 5- or 6-membered rings;  
n is an integer;  
y is 0, 1, 2, or 3;  
z is 0, 1, 2, 3, or 4; and  
25 a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ .
19. The device of Claim 18 wherein Ar<sup>1</sup> is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
- 30 20. The device of Claim 18 wherein N(R<sup>1</sup>)<sub>2</sub> is selected from carbazoles, benzodiazoles, and benzotriazoles.
21. The device of Claim 18 wherein R<sup>1</sup> is selected from alkyl groups having 1 through 12 carbon atoms, phenyl and benzyl.
22. An electronic device comprising a composition comprising a  
35 polymer having at least one first monomeric unit having Formula II(a) in Figure 2, wherein:

$R^2$  and  $R^3$  are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;

$R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

n is an integer;

x is 0, 1 or 2; and

y is 0 or an integer from 1 through 3;

with the proviso that there is at least one substituent on an aromatic group selected from F,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ .

23. An electronic device comprising a composition comprising a polymer having at least one first monomeric unit having Formula II(b) in Figure 2, wherein:

$R^2$  and  $R^3$  are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;

$R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

n is an integer;

x is 0, 1 or 2; and

y is 0 or an integer from 1 through 3;

with the proviso that there is at least one substituent on an aromatic group selected from F,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ .

24. An electronic device comprising a composition comprising a polymer having at least one first monomeric unit having Formula II(c) in Figure 2, wherein:

$R^2$  and  $R^3$  are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;

$R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

n is an integer;

- p is 0 or 1; and  
y is 0 or an integer from 1 through 3;  
with the proviso that there is at least one substituent on an aromatic group selected from F,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ .
- 5        25. The device of any one of Claims 22, 23, or 24, wherein  $R^2$  is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
26. The device of Claims 22, 23, or 24, wherein  $R^4$  is selected from phenylene, phenylenalkylene, alkylene and alkenylene.
- 10        27. An electronic device comprising a composition comprising a polymer having at least one first monomeric unit having Formula III(a), in Figure 3, wherein:
- $R^4$  is the same or different at each occurrence and is selected from alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;
- 15         $R^5$  is the same or different at each occurrence and is selected from H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl, alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl, alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ , or both of  $R^5$  together may constitute an arylene or
- 20        heteroarylene group;
- a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,
- n is an integer; and
- 25        z is 0 or an integer from 1 through 4.
28. An electronic device comprising a composition comprising a polymer having at least one first monomeric unit having Formulae III(b) to III(d), in Figure 3, wherein:
- $R^4$  is the same or different at each occurrence and is selected from
- 30        alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;
- $R^5$  is the same or different at each occurrence and is selected from H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl, alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl, alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ,
- 35        or both of  $R^5$  together may constitute an arylene or heteroarylene group;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

n is an integer;

x is 0, 1, or 2;

5 y is 0, 1, 2, or 3; and

z is 0, 1, 2, 3, or 4.

29. The device of Claims 27 or 28, wherein  $R^4$  is selected from phenylene, phenylenalkylene, alkylene and alkenylene.

10 30. The device of Claims 27 or 28, wherein  $R^5$  is selected from phenylalkenyl groups, phenylakynyl groups, alkylacetate groups, arylcarbonyl groups, alkyl groups having 1 through 12 carbon atoms, phenyl groups, substituted phenyl groups, pyridyl groups, and substituted pyridyl groups.

15 31. The composition of Claims 27 or 28, wherein two adjacent  $R^5$  together are a biarylene group.

32. An electronic device comprising a material comprising a polymer having at least one first monomeric unit having Formulae I(a) through I(c) in Figure 1 and at least one second monomeric unit selected from Formulae II(a) through II(c) in Figure 2 and Formulae III(a) through  
20 III(d) in Figure 3, wherein:

in Formula I(a) through I(c):

$Ar^1$  can be the same or different at each occurrence and is selected from aryl and heteroaryl;

25  $Ar^2$  can be the same or different at each occurrence and is selected from arylene and heteroarylene;

$R^1$  can be the same or different at each occurrence and is selected from H, alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene,  $C_nH_aF_b$ , and  $C_6H_cF_d$ ; or adjacent  $R^1$  groups can be joined to form 5- or 6-membered rings;

30 n is an integer;

y is 0, 1, 2, or 3;

z is 0, 1, 2, 3, or 4; and

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ;

35 in Formulae II(a) through II(c):

$R^2$  and  $R^3$  are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;



- $R^4$  is the same or different at each occurrence and is selected from  
 alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;  
 a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d$   
 = 5,  
 5     n is an integer;  
       p is 0 or 1;  
       x is 0, 1 or 2; and  
       y is 0 or an integer from 1 through 3;  
       with the proviso that there is at least one substituent on an aromatic  
 10    group selected from F,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ;  
       in Formulae III(a) through III(d):  
        $R^4$  is the same or different at each occurrence and is selected from  
       alkylene, heteroalkylene, alkenylene, arylene, or heteroarylene;  
 15     $R^5$  is the same or different at each occurrence and is selected from  
       H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl,  
       heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl,  
       alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl,  
       alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ,  
       or both of  $R^5$  together may constitute an arylene or  
 20    heteroarylene group;  
       a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d$   
       = 5,  
       n is an integer;  
       x is 0, 1, or 2;  
 25    y is 0, 1, 2, or 3; and  
       z is 0 or an integer from 1 through 4.
33. An electronic device comprising a composition comprising a  
 polymer having at least one first monomeric unit selected from Formulae  
 IV(a) through IV(e) in Figure 4.
- 30     34. An electronic device comprising a composition comprising a  
 polymer having at least one first monomeric unit having Formula IV(f) in  
 Figure 4.
- 35     35. A composition comprising a polymer having at least one first  
 monomeric unit having Formula I(b) or I(c) in Figure 1, wherein:  
        $Ar^1$  can be the same or different at each occurrence and is selected  
       from aryl and heteroaryl;  
        $Ar^2$  can be the same or different at each occurrence and is selected  
       from arylene and heteroarylene;

$R^5$  is the same or different at each occurrence and is selected from  
H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl,  
heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl,  
alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl,  
5 alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ,  
or both of  $R^5$  together may constitute an arylene or  
heteroarylene group;  
a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d$   
= 5,  
10 n is an integer (as above);  
y is 0 or an integer from 1 through 3;  
z is 0 or an integer from 1 through 4; and  
wherein such polymer is not a homopolymer.  
36. A composition comprising a polymer having at least one first  
15 monomeric unit having Formula III(c) or III(d) in Figure 3, wherein:  
 $R^4$  is the same or different at each occurrence and is selected from  
alkylene, heteroalkylene, alkenylene, arylene, heteroarylene or  
arylenealkynylene;  
 $R^5$  is the same or different at each occurrence and is selected from  
20 H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl,  
heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl,  
alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl,  
alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ ,  
or both of  $R^5$  together may constitute an arylene or  
25 heteroarylene group;  
a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d$   
= 5,  
n is an integer;  
x is 0, 1, or 2;  
30 y is 0 or an integer from 1 through 3; and  
wherein such polymer is not a homopolymer.  
37. A composition comprising a polymer having at least one first  
monomeric unit having Formula III(b), wherein:  
 $R^4$  is the same or different at each occurrence and is selected from  
35 alkylene, heteroalkylene, alkenylene, arylene, heteroarylene or  
arylenealkynylene;  
 $R^5$  is the same or different at each occurrence and is selected from  
H, F, Cl, Br, hydroxyl, carboxyl, carbonyl, silyl, siloxyl, alkyl,

heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, alkylenearyl, alkenylaryl, alkynylaryl, alkyleneheteroaryl, alkenylheteroaryl, alkynylheteroaryl,  $C_nH_aF_b$ ,  $OC_nH_aF_b$ ,  $C_6H_cF_d$ , and  $OC_6H_cF_d$ , or both of  $R^5$  together may constitute an arylene or  
5 heteroarylene group;

a, b, c, and d are 0 or an integer such that  $a+b = 2n + 1$ , and  $c + d = 5$ ,

n is an integer;

x is 0, 1, or 2; and

10 wherein such polymer is not a homopolymer.

<sup>36</sup> 37. A device comprising a layer of material comprising the polymer of Claims 35, 36, or 37.

<sup>39</sup> 38. A device according to Claims 18, 35, 36, and 37, wherein the device is a light-emitting diode, light-emitting electrochemical cell, or a  
15 photodetector.